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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
YU, MELANIE J	

ART UNIT	PAPER NUMBER
1641	

MAIL DATE	DELIVERY MODE
06/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/750,301	SU ET AL.	
	Examiner	Art Unit	
	Melanie Yu	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,33,34 and 94* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,33,34 and 94* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment filed 6 March 2007 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Halas et al. (US 6,778,316) in view of Leonard et al. (US 7,029,631).

Halas et al. teach a system comprising: a gel matrix comprising a gel comprising: pores having a size to sieve molecules of a desired size range (matrix permeable to analyte, col. 3, lines 14-19; matrix is a sol-gel, col. 6, lines 9-11) and one or more SERS enhancing nanoparticles stationary within the gel (resonant nanoparticles embedded in matrix and are therefore stationary, col. 3, 14-19). Halas et al. teach the gel being a sol-gel (col. 6, lines 9-11) and therefore fail to specifically teach the gel capable of sieving molecules by electrophoresis for magnetophoresis.

Leonard et al. teach that an agarose, acrylamide or sol-gel may be used to contain ligands or receptors in a three dimensional gel (col. 5, lines 34-48), in order to provide increased stability with a localized point of optical interrogation.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include as the gel of Halas et al., an agarose or polyacrylamide gel instead of a sol-gel as taught by Leonard et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent gel technique and since a similar matrix structure would have been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components. Although Leonard et al. do not specifically teach sieving of analyte by

electrophoresis, a gel of agarose or acrylamide as taught by Leonard et al. would be capable of such a limitation.

3. Claims 33 and 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halas et al. (US 6,778,316) in view of Leonard et al. (US 7,029,631) further in view of Schultz et al. (US 6,180,415).

Halas et al. teach a system comprising: a gel matrix comprising a gel comprising: pores having a size to sieve molecules of a desired size range (matrix permeable to analyte, col. 3, lines 14-19; matrix is a sol-gel, col. 6, lines 9-11) and one or more SERS enhancing nanoparticles stationary within the gel (resonant nanoparticles embedded in matrix and are therefore stationary, col. 3, 14-19), wherein the analyte is adsorbed to the surface of the stationary nanoparticles (col. 3, lines 36-38); a sample containing at least one analyte (measurable property is concentration of analyte in sample, col. 2, lines 48-51) and an optical detection system suitable for detecting SERS signals from the nanoparticles (Raman optical detection, col. 3, lines 36-49). Halas et al. teach the gel being a sol-gel (col. 6, lines 9-11) and therefore fail to specifically teach the gel capable of sieving molecules by electrophoresis for magnetophoresis.

Leonard et al. teach that an agarose, acrylamide or sol-gel may be used to contain ligands or receptors in a three dimensional gel (col. 5, lines 34-48), in order to provide increased stability with a localized point of optical interrogation.

Shultz et al. teach SERS-enhancing nanoparticles having an attached probe that binds specifically to an analyte (PRP is a nanoparticles, col. 8, lines 25-27; and are SERS nanoparticles, col. 10, lines 14-26; target ligand is attached to nanoparticles, col. 23, lines 40-48 and 54-61), in order to provide bind and detect analyte.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include as the gel of Halas et al., an agarose or

polyacrylamide gel instead of a sol-gel as taught by Leonard et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent gel technique and since a similar matrix structure would have been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components. Although Leonard et al. do not specifically teach sieving of analyte by electrophoresis, a gel of agarose or acrylamide as taught by Leonard et al. would be capable of such a limitation. It would have further been obvious to one having ordinary skill in the art at the time the invention was made to include in the on the nanoparticles of Halas et al. in view of Leonard et al., an attached probe that binds specifically to an analyte as taught by Schultz et al., in order to improve accuracy and sensitivity of detection of analyte and draw the analyte to the surface of the embedded nanoparticles.

With respect to claims 2 and 5, Schultz et al. teach the gel matrix comprising a plurality of nanoparticles to provide a plurality of unique optical signatures (nanoparticles are in the gel matrix and properties of nanoparticles are described at col. 3, lines 28-36; col. 5, lines 39-42; col. 9, lines 18-47). Shultz et al. also teach the nanoparticles providing a unique SERS-signal that is correlated with the binding specificity of the probe of the nanoparticles (col. 5, lines 25-42; col. 14, lines 41-43; col. 14, lines 21-43).

Regarding claims 3 and 4, Shultz et al. teach the SERS-enhancing nanoparticles comprising one or more Raman active tags of fluorescent dyes and nucleic acids (col. 3, lines 42-48) and at least one of the nanoparticles having a net charge (col. 30, lines 55-57).

With respect to claims 7-12, Shultz et al. teach nanoparticles being composite organic-inorganic nanoparticles comprising a core and a surface, wherein the core comprises a metallic colloid comprising a first metal and a Raman-active organic compound (col. 24, lines 44-50; col. 23, lines 35-48). Shultz et al. teach the COINs further comprising

a second metal different from the first metal forming a layer over overlying the surface of the nanoparticles (silver shell and gold core, col. 23, lines 35-39) and further comprising an organic layer overlying the metal layer, which organic layer comprises a polynucleotide probe (col. 23, lines 40-48 and 54-61; col. 5, lines 60-67). Schultz et al. further teach at least some of the nanoparticles further comprising a fluorescent label that contributes to the optical signature (col. 23, lines 40-48).

Regarding claim 34, Shultz et al. teach a computer comprising an algorithm for analysis of the SERS signals obtained from the sample (col. 15, line 66-col. 16, line 4).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Halas et al. (US 6,778,316) in view of Leonard et al. (US 7,029,631) further in view of Schultz et al. (US 6,180,415) and Mirkin et al. (US 2003/0211488).

Halas et al. in view of Leonard et al. further in view of Shultz et al., as applied to claim 1, teach a gel matrix comprising a nanoparticles with one or more Raman-active tags, but fail to teach the Raman-active tag comprising adenine.

Mirkin et al. teach a Raman-active tag being an analog of adenine, poly-adenine (par. 181), in order to utilizing a spectroscopic fingerprint in protein-protein screening.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the solid gel matrix of Halas et al. in view of Leonard et al. further in view of Shultz et al., a nanoparticles comprising a Raman-active tag of an analog of adenine as taught by Mirkin et al., in order to provide increased sensitivity and specificity of detection of analyte.

Response to Arguments

5. Applicant's arguments with respect to claims 1-12, 33, 34 and 94 have been considered but are moot in view of the new ground(s) of rejection. The previous rejections of the claims have been withdrawn. However, upon further consideration, a new ground(s)

of rejection is made in view of Halas et al. teaching a nanoparticles embedded in a gel matrix.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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